1856MNRAS..17...27S

The observed times of Minima of short-period Variables require to be reduced to what they would have been at the earth's mean distance from the star, to render them comparable with each other, or with the above ephemerides. The following formulæ will supply these corrections, with their proper signs, in minutes of time, for each star; the earth's radius-vector and sun's longitude being denoted by R and ⊙ respectively:—

	m		°	′	
For Algol	7·67	R sin	(215	47	+ ⊙)
λ Tauri	8·22	R sin	(211	19	+ ⊙)
δ Cephei	4·21	R sin	(254	19	+ ⊙)
η Aquilæ	7·72	R sin	(331	31	+ ⊙)
S Cancri	8·30	R sin	(143	38	+ ⊙)
ζ Geminorum ...	8·29	R sin	(166	58	+ ⊙)
β Lyræ	4·64	R sin	(343	4	+ ⊙)

On the Correction of Observations made with the Sextant. By W. H. Simms, Esq., communicated by William Simms, Esq.

The object of this communication is to demonstrate the practicability of correcting sextant observations for the instrumental error of excentricity;—an error, which probably exists in most sextants, and to such an amount that the maximum correction to an angle read from the arc is seldom less than 30″, and not uncommonly exceeds 1′.

The author commences by investigating the formula for the computation of the correction, the relative position of the centres of the index and arc being given. This relative position depends upon two constants, which enter into the formula: consequently, two or more absolute values of the correction being known, the constants can be determined. Such absolute values can be obtained in any number by comparing the results of observation of distances of well-known stars with their computed distances; or, at a place of which the latitude is known, by observation of meridian altitudes of similar objects. The latter method is undoubtedly the better and more convenient, and may be employed at a place of which the latitude is unknown, the latitude itself being introduced as a third unknown quantity into the equations resulting from the observations.

But, in order that this process may be applied with success, it is evidently necessary that the results of the observations should not be materially affected by any instrumental error other than excentricity. The author accordingly investigates the formulæ for the calculation of the corrections due to the remaining three principal errors to which the sextant is liable, viz. deviations of the planes of the index and horizon glasses, and of the optical axis, from their correct positions with respect to the plane of the instrument;—and shows that, if ordinary care be taken in the

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1856MNRAS..17...28S

performance of the requisite adjustments, such of these errors as are likely to exist in a good instrument will not sensibly affect the results. The investigation is given at length in the case of an error in the position of the horizon glass, the formulæ only being given in each of the other cases, as well as in a combination of the three; this having been thought sufficient as an indication of the process. The results of these investigations are satisfactory, not only with reference to their immediate object—the demonstration of the fact that excentricity is the only instrumental error which, under ordinary circumstances, produces sensible effects—but as showing that small accidental disturbances of the horizon glass, such as frequently take place in the course of a series of observations, are unimportant, provided they do not affect the index error.

Having shown that the results of observation are sensibly affected by error of excentricity alone, the author proceeds to explain in detail the processes by which the values of the two constants, which enter into the formula for the computation of the correction may be determined; and concludes, by giving examples of their determination, and of the construction of tables of corrections for various positions of the index upon the arc.

A note is appended to the communication containing details relative to the determination of index errors.

On the Latitude of the Liverpool Observatory, deduced from Observations made with a Transit Instrument placed in the Prime Vertical, by means of Formulæ given by W. H. Simms, Esq.

In vol. xiii., No. 8, of the *Monthly Notices* of the Society, is a communication by Mr. Hartnup, on the latitude of the Liverpool Observatory, from observations made with a transit-instrument placed in the prime vertical. The formulæ used for the reduction of the observations, as stated in that paper, were obtained from Mr. W. H. Simms, who was at that time resident at Colombo, in Ceylon.

Mr. Simms, being now in England, has communicated to Mr. Hartnup his investigations in a revised shape, and has given the formula for deviation from the prime vertical in a more convenient form, and, at the same time, has introduced the effect of an error of collimation on the results, which was neglected in his former communication. With these new formulæ, he has calculated the corrections for deviation and collimation for the whole series of observations previously employed in deducing the latitude; and Mr. Hartnup has taken the opportunity of making a fresh determination of this element. The whole number of

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